

Vak: Data Science 3

credits: 5

Vakcode BFVM22DATASC3
Naam Data Science 3
Studiejaar 2022-2023
ECTS credits 5
Taal Engels
Coördinator F. Feenstra

Werkvormen Hoorcollege
Toetsen TOETS-01 - Schriftelijk, organisatie
ToetsCentrum
TOETS-02 - Opdracht

Leeruitkomsten

The student:

- can implement and apply numerical methods for analysis of data, including differentiation, integration and finding roots and extrema
- understands how finite precision and discretization errors may affect the results of outcomes
- can explain whether and how a life science data set corresponds to a graph
- can implement available graph-based algorithms to process data
- can explain whether and how a life science data set can be described by a multiset multilinear model
- can implement a specific multiset multilinear model for integrative modelling of data

Inhoud

Numerical analysis (2w): discretization and round-off, numerical differentiation and integration of functions, finding roots and extrema, integrating differential equations

Graph theory (2w): graphs, trees, adjacency matrix, directed acyclic graphs, paths and cycles, tree search, shortest path, random walks, Markov chains, sorting, algorithmic complexity

Multivariate data analysis (3w): multiple linear regression, partial least squares, canonical correlations, singular value decomposition, principal component analysis

The course introduces the student to relational models of data, in the form of graphs and multilinear models. An introduction to graph theory is presented, with a number of methods for investigation, and assessment of relational features, with applications to the life science. In addition, the course introduces multivariate linear models for describing relations within and between complex datasets, with focus on the meaning and interpretation of results. These subjects are complemented with a number of topics on numerical analysis, which have implications for numerical modelling and evaluation.

Opgenomen in opleiding(en)

Master Data Sciences for the Life Science

School(s)

Instituut voor Life Science & Technology

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